

Article

Mom Knows More than a Little Ghost: Children's Attributions of Beliefs to God, the Living, and the Dead

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Abstract: The growing body of research on children's understanding of extraordinary minds has demonstrated that children believe in the persistence of mental functioning after death. However, beyond the continuity of mind, the supernatural conception of death often involves the concept of the disembodied mind, which transcends the constraints of the physical body, possessing supernatural mental capacities. The current study investigated whether children differentiate between a dead agent's mind and ordinary minds in terms of their perceptual and information-updating capacities. In a location-change false-belief task, which involved a story of a mouse protagonist that was either eaten by an alligator or not, 4- to 6-year-old Korean children ($N = 114$) were asked about the mental states of the protagonist, an ordinary adult (mom), and God. The results showed (1) older children's tendency to respond in a way that differentiated (the living) mom from the dead protagonist, (2) an increasing trend of differentiating God's super-knowingness from ordinary minds with age, and (3) inconclusive evidence regarding children's differential responses to the dead versus living protagonist. This study suggests that children are not predisposed to view dead agents as possessing a disembodied and supernatural mind, highlighting the importance of cultural learning in the development of such religious concepts.



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1. Introduction

Sally places a ball in her basket and leaves the room. During her absence, Anne moves the ball into her box. When Sally returns to play with the ball, where will she look for it? The majority of people, including 4- to 5-year-old children, would answer that Sally will look for it in her basket, demonstrating their understanding that Sally's false belief ("the ball is still there") will influence her actions. But what if Sally tragically passes away in an accident before returning home? Where do children think dead Sally would think the ball is? The present research investigated this question.

Contemporary neuroscience and psychology predominantly view the mind–body problem—how the mind and the body are related to each other—through physical monism, which claims that the mind emerges from the biological functioning of the brain and nervous system, thus ceasing with them. Yet, a considerable number of people, including even health-care professionals, still hold dualistic views, believing in transcendent minds and afterlife (e.g., Bering 2002; Bloom 2007; Chudek et al. 2013; Demertzi et al. 2009; Musolino 2015). While these dualistic beliefs have been extensively explored in religious

and philosophical discussions, psychology has addressed them less frequently and in a narrower context, like in psychological strategies to cope with existential anxieties (e.g., [Atran 2004](#); [Freud 1961](#); [Greenberg et al. 1986](#)). Recent developments in the cognitive science of religion (CSR) have extended these discussions, addressing how the architecture of the human mind generates religious and supernatural concepts and how they differ from natural concepts in cognitive processes and development. Building on CSR research, this study investigated children's conception of the dead's mental capabilities.

We recognize others' actions as being driven by their mental states—such as beliefs, thoughts, and desires—which may be different from our own. This mentalizing capacity, often referred to as “Theory of Mind” (ToM), is a socio-cognitive function essential for navigating the social world ([Baron-Cohen et al. 1985](#); [Waytz et al. 2010](#)). ToM plays a critical role in understanding and interpreting others' agency—their capacity to initiate and control actions to achieve goals based on their mental states. By allowing individuals to recognize others as intentional agents, ToM further helps them predict, influence, and respond to others' behavior, thereby facilitating effective social interactions ([Waytz et al. 2010](#), for a review).

At the core of ToM lies the concept of meta-representation, the capacity to represent how agents represent the world from their own perspectives. Following [Dennett's \(1978\)](#) commentary on [Premack and Woodruff's \(1978\)](#) investigation into a chimpanzee's representations of a human actor's mental states, [Wimmer and Perner \(1983\)](#) devised the “false-belief” (FB) task, which implemented the minimal condition under which one should credit children with a representational ToM as follows: being able to acknowledge that individuals can hold beliefs that do not match reality (e.g., “the ball is still in the basket” in the above story) and that such FBs can influence their actions. Decades of subsequent research have shown a converging pattern of a robust, representational ToM emerging at around 4–5 years of age, such that, children aged 4–5 years acknowledge that others can have FBs, but children younger than four years fail to acknowledge FB ([Wellman et al. 2001](#), for a review of recent advances and issues on this topic, see also [Rakoczy 2022](#)).

Interestingly, both adults and children tend to consistently attribute a mind, not only to humans, but also to non-human entities such as animals, machines, and supernatural agents like God and ghosts ([Waytz et al. 2010](#)). Thus, the way children mentalize non-human agents can be an issue of great importance for a complete understanding of socio-cognitive development, and conversely, ToM research can provide insights into how children think about various non-human minds. Given the importance of this, ToM research has extended its scope to the religious domain of supernatural minds.

In their seminal work, [Barrett et al. \(2001\)](#) examined children's conception of God's knowledge or beliefs (i.e., theory of God's mind). Using a surprising-contents FB task, they presented 3- to 8-year-olds in the United States with a cracker box containing rocks and a brown bag containing crackers and asked them where various agents (mom, a bear, a snake, a tree, and God) would look for crackers. They found that children predominantly responded that God would look in the bag; in more detail, while 3- and 4-year-olds attributed such knowledge to all agents, older children, who came to understand the limitations of human knowledge, attributed true belief (TB) or all-knowingness to God but ignorance to the other agents. Given these findings, Barrett et al. interpreted younger children's failure on the FB task (reporting that God, as well as the other agents, would know what they knew) as evidence of their inference being omniscience-biased (i.e., cognitively prepared to understand God's infallible, super-knowing mind). While these findings were replicated cross-culturally ([Knight et al. 2004](#)), later studies using a fine-grained sampling of ages or knowledge-ignorance tasks (in which a container is presented but its contents remain hidden) suggest that children initially view God's knowledge as more human-like,

developing a fuller understanding of omniscience around age 5 as they grasp human cognitive limits (e.g., [Giménez-Dasí et al. 2005](#); [Lane et al. 2010, 2012](#); [Lane 2021](#); [Makris and Pnevmatikos 2007](#)).

Recent research has expanded to include “in-between” agents, like angels, Santa Claus, and imaginary friends, seen in many cultures as more knowledgeable than humans but less so than an all-knowing God. Studies using FB tasks showed that children attribute more knowledge to these beings than to humans, but less compared to God ([Burdett et al. 2021](#); [Knight 2008](#); [Wigger et al. 2013](#)). This indicates that extraordinary mental capacities are represented not as a simple natural vs. supernatural dichotomy, but on continuous dimensions, with omniscient God and ordinary humans at opposite ends.

On the other hand, religious beliefs across cultures typically rest on two foundational concepts—God (or deities) and the afterlife—and the most ancient and widespread form of deity concepts, such as ancestral spirits or ghosts, derives from afterlife beliefs ([Barrett 2007](#)). Thus, to further understand how the belief system for ordinary minds can expand into the religious minds, the developmental trajectory of the religious conception of death—a transition from a bodily life on earth to a disembodied afterlife (in contrast to the natural conception of death as a terminus for living processes)—should be investigated. Previous research on children’s concepts of the afterlife primarily focused on whether they believe in the continuation or cessation of various capacities after death. In a seminal study by [Bering and Bjorklund \(2004\)](#), children aged 3–12 watched a puppet show where a personified mouse was eaten by an alligator, and they then answered questions about the mouse’s physical and mental functions post-death. The findings indicated that children of all ages attributed more mental than bodily capabilities to the deceased mouse, which was more pronounced in younger children. This suggests that children may be predisposed to view the mind as separate from the body ([Bering 2006](#)). This was the case in studies on children’s conceptions of God; however, more recent studies offered findings incompatible with this intuitive dualism hypothesis, showing that beliefs in the persistence of mental functioning after death increase rather than decrease with age ([Astuti and Harris 2008](#); [Harris and Giménez 2005](#)). These studies further demonstrated that immortality responses were context-sensitive, as children were more likely to endorse the “continuity” belief when death was described in religious, as opposed to medical, narratives. Thus, the researchers concluded that children initially form the naturalistic conception of death and, on the basis of this foundation, can later entertain the supernatural ideas of immortality and the afterlife.

In the context of this study, one notable but less highlighted aspect of the supernatural conception of death is the coexistence of two incompatible features of the postmortem mind. As people have two distinct and inconsistent God concepts—a concrete, anthropomorphic concept, held implicitly, and an abstract, theologically correct, and supernatural concept, held explicitly—which are each activated in different contexts ([Barrett and Keil 1996](#)), beliefs about the postmortem mind are also multifaceted with inconsistent features. They might encompass the continuation of the ordinary mind (possibly in a weakened form) and the manifestation of supernatural capacities beyond the constraints of a physical body. For instance, in a religious context, a deceased individual is often considered to maintain emotional connections to and desires about their loved ones, akin to a weakened ordinary mind (e.g., [Bering 2002](#); [Gray et al. 2011](#)). On the other hand, prototypical postmortem agents prevalent in many religious or cultural narratives, like ghosts or ancestor spirits, are essentially disembodied minds (although sometimes they are conceived as possessing bodies). As a natural consequence of their disembodiedness, they are often envisioned as entities possessing supernatural capacities (e.g., teleportation or walking through walls) that transcend the constraints of the physical world. In terms of their information-gathering capacity, this conception suggests that the dead, unbound by bodily senses, may possess

enhanced or extraordinary perceptions, allowing them full access to the information that ordinary agents have limited access to (Boyer 2001). If so, the dead could be perceived as an “in-between” agent, with a super-knowing capacity that is greater than that of humans.

Given (1) that the representational or mentalizing capacity is a hallmark of the human mind and (2) that the supernatural or religious conception of the dead’s mind would include supernatural perceptual and information-updating capacities, the current study investigated whether children’s theory of the mind of the dead differs from that of ordinary minds. More specifically, we examined whether they attribute more knowledge to a dead individual than a living one when death is framed in a religious context.

Most research following Barrett et al.’s (2001) seminal study on children’s understanding of supernatural minds has used the surprising-contents FB task (Perner et al. 1987) or its variants, which might have advantages over another commonly used, location-change task (Wimmer and Perner 1983). While the location-change task requires tracking object locations and multiple characters’ actions, the surprising-contents task, focusing on the mental states (beliefs about a container’s contents) of target agents in simpler and context-less scenarios, offers a clearer assessment of children’s conception of different minds. However, using the surprising-contents task to compare conceptions of a dead agent (like an ancestor spirit or deceased grandmother) with an ordinary person (like a girl) may introduce confounding factors, in that the two agents being compared differ, not only in biological state, but also in many other factors including identity, age, and time of survival.

From the religious conception of death as a transition, dead agents stand apart from other religious entities like God or angels who are considered as separate entities on their own. That is, a deceased individual has a counterpart—his/her former living self. Taking advantage of this unique aspect of dead agents, we adopted a living–dead pairing approach. By presenting scenarios where the protagonist’s final biological state was manipulated to be either “alive” or “dead”, we compared the living and dead states of the same individual while controlling for other variables. The location-change task was more suitable for this approach, as it can incorporate the manipulation of a character’s biological state into the task scenario.

In this study, we engaged 4- to 6-year-old children with a story about a little personified mouse running an errand to his grandmother’s home, inspired by Bering and Bjorklund’s (2004) narrative. Using a location-change task, the story described the mouse placing a ball in one location before heading to the grandmother’s house, and his younger sibling subsequently moving the ball elsewhere. The children were exposed to different story versions as follows: in one, the mouse safely reaches the grandmother’s home; in the other, he is eaten by an alligator en route. After hearing the whole story, they were asked FB questions regarding where the mouse (alive or dead) would think the ball is (“think” question) and look for it (“look” question).

To estimate where a deceased agent is positioned on the extraordinary-mind continuum in terms of extraordinary information-updating capacities, we additionally assessed children’s FB attribution to two other agents—an ordinary living adult (mom) and God—who likely represent two ends of the continuum. We provided all children with specific information about God (“God is invisible but sees us”), aligning with the common religious conception of a disembodied, all-watching, and all-knowing God. This approach aimed (1) to control for individual differences in their religious background and knowledge about God and (2) to prime the spiritual or religious conception of death rather than the naturalistic one. In addition, to reinforce the religious framing of death, we described the protagonist’s dead state as he “went to heaven”, rather than stating he “died” or “is not alive anymore” (Bering and Bjorklund 2004). We hypothesized that if children view the dead as an “in-between” agent, not bound by physical limitations, they would adopt this

religious framing of death and attribute FB to the dead mouse protagonist *less* frequently than to the living one.

2. Method

2.1. Participants

Participants initially included 114 Korean children, but 27 of them were excluded from the analysis as they failed to pass either a biological question or a reality control question (see Section 3. Results). The final sample of 87 children ($M_{\text{age}} = 64.5$ months, $SD = 9.5$, range = 48 to 83 months) comprised 42 in the alive condition (19 males, $M_{\text{age}} = 64.6$ months) and 45 in the dead condition (26 males, $M_{\text{age}} = 64.4$ months). Neither age nor gender distribution varied significantly between these two conditions, $t(85) = 0.06$, $p = 0.95$ for age, and $\chi^2(1) = 1.37$, $p = 0.24$ for gender. The study was approved by the university's IRB and written informed consent was obtained from parents prior to their child's participation.

2.2. Design and Procedure

Children were tested individually either in the developmental psychology lab at Ewha Womans University or in their home. Prior to the FB task, the experimenter introduced children to five personified animal characters that would appear in the FB story (Squeeky, his younger sibling, mom, grandmother, and an alligator) and God, each depicted on a laminated card (Figure 1a). The following information about them was verbally given to them (all verbal materials were given in Korean): (a) the mouse named Squeeky likes to play with a ball; (b) Squeeky has a mischievous younger sibling; (c) an alligator lives near Squeeky's house, whose favorite food is mice; (d) Squeeky's grandmother lives near his town; and (e) God is invisible but seeing us. For the pictorial depiction of God, we used rays of light (i.e., "God rays"), which is known as a typical, non-anthropomorphic symbol of God or the Holy Spirit.

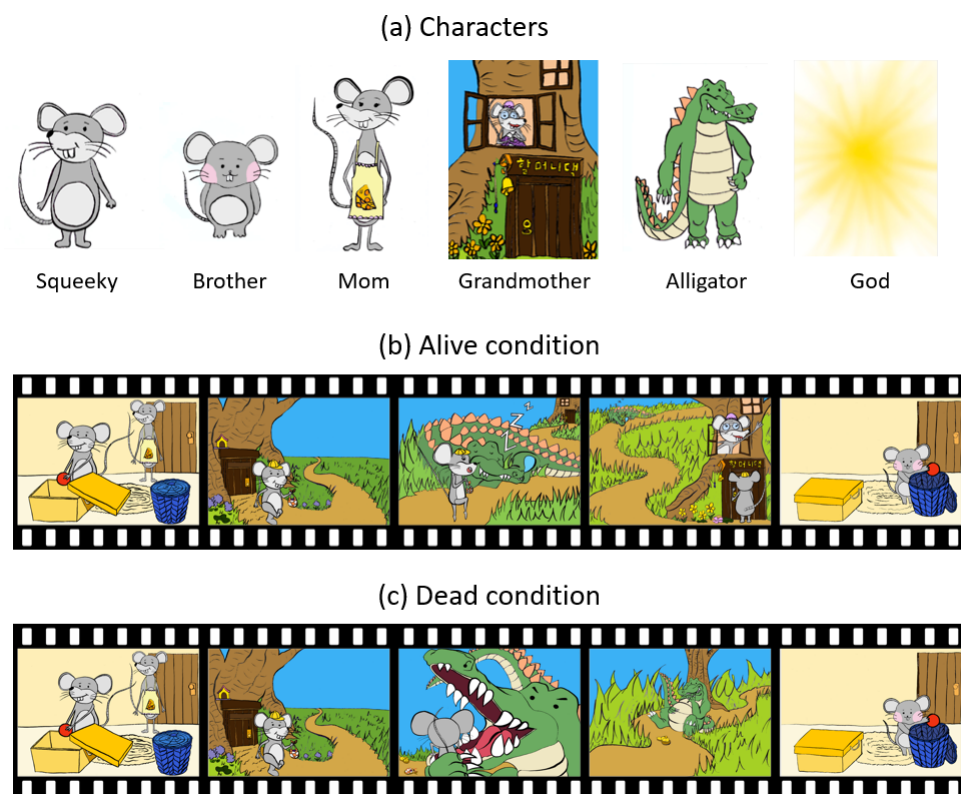


Figure 1. (a) Images of characters, (b,c) summary description of the scenario in the alive (b) and dead (c) conditions. For a complete description of the pictures and scripts, see Appendix A.

Children were presented with a story using a large picture book placed on an inclined wooden bookstand, with the pages bound at the top. For each scene, the experimenter turned a page toward the child and described the scene using standardized scripts (Figure 1b,c; for a complete description of the pictures and scripts, see Appendix A).

In a between-participants design, children were randomly assigned to either the alive or dead conditions of the scenario, outlined as below:

Squeeky was playing with a red ball in his room when Mommy Mouse asked him to take a gift to his grandmother. He put his ball into a yellow box in the room and then set off to his grandma's house, walking along the road next to the bushes. [alive] The alligator behind the bushes was asleep and didn't notice Squeeky, so he safely reached his grandma's house. [dead] The alligator behind the bushes watched Squeeky and ate him. After that, Squeeky went to heaven.

The beginning of the story was identical in both conditions, and in the final part, Squeeky ended up either safely reaching the grandmother's home (alive condition) or being eaten up by an alligator (dead condition). To describe Squeeky's death, we avoided direct terms like "died" or "was dead", but instead used "went to heaven" (1) to prime the spiritual rather than the naturalistic conception of death and (2) to address ethical considerations when discussing death with children. While telling the story, the experimenter asked children four questions to ensure their understanding of the story to (Q1), access their beliefs about the continuity or discontinuity of biological (Q2) and psychological (Q3) functions after death, and to reduce their memory load (Q4). Children who failed Q1 or Q4 were corrected (for more details, see Appendix A).

At the end of the story, children were asked two control questions as follows: a memory control ("Where did Squeeky put the ball before he left?") and a reality control ("Where is the ball now?"). They were then asked two key FB questions regarding where Squeeky would "think" the ball is and "look" for it. The FB "think" question was also extended to two other agents, mom and God, but the "look" question was excluded for them, due to their presumed disinterest in playing with the ball. The sequence of these questions was fixed, starting with the main character, then a secondary character, and finally an outside agent, for clarity and ease of understanding for the children (for more details, see Appendix A).

2.3. Statistical Analysis Protocol

Children's responses to FB questions were coded "1" (=a FB response) if they indicated that the agent would think or look for the ball in the yellow box (its original location) and "0" (=a TB response) if they indicated that the agent would think or look for the ball in the blue basket (its current location).

We conducted a generalized linear mixed model (GLMM) with logit link function to capture the full design of the study. The maximal random-effects structure (Barr et al. 2013) included by-participant random intercepts, through which we could appropriately account for the repeated measurements within individuals (Baayen et al. 2008). Another advantage of mixed-effects modeling over traditional methods is the ability to better handle unbalanced observations across participants or conditions due to missing data, as in the present study (Judd et al. 2012). The fixed effect predictors included were the scenario condition (0 = alive, 1 = dead), agent (0 = SQ-think ["think" question about Squeeky], 1 = SQ-look ["look" question about Squeeky], 2 = mom, 3 = God), age in months (continuous, centered), and their two- and three-way interactions. We obtained *p* values using chi-square tests on the log-likelihoods, comparing the models with and without the fixed effect term of interest. All statistical analyses were performed using the GAMLj module (Gallucci 2020) in jamovi (Jamovi 2021).

3. Results

Table 1 presents the summary of children’s responses to biological and psychological questions. To the biological question (“Will Squeeky be able to grow up to be an old mouse?”) in the alive condition, all 45 participants correctly provided “continuity” (“yes”) responses. In the dead condition, only 46 of 69 participants correctly gave “discontinuity” (“no”) responses; we dropped the 23 participants who failed this question, as they did not seem to have a relevant level of biological knowledge about death. The psychological question (“Will Squeeky miss his mom?”) was not used for participant-screening purposes, but most children in both the dead and alive conditions provided “continuity” responses, supporting the mental-state privileging the pattern reported in other afterlife studies (e.g., Bering and Bjorklund 2004).

Table 1. Summary of responses to the biological or psychological questions (initial $N = 114$).

Scenario Condition		Biological Question			Psychological Question		
		Continuity	Discontinuity	Missing	Continuity	Discontinuity	Missing
Alive	%	100.0%	0.0%	0.0%	84.4%	11.1%	4.4%
	(n)	(45)	(0)	(0)	(38)	(5)	(2)
Dead	%	30.4%	66.7%	2.9%	92.8%	7.2%	0.0%
	(n)	(21)	(46)	(2)	(64)	(5)	(0)

Note: Missing data include “don’t know” or no responses.

Among the children who passed the biological question ($N = 91$), 11 children (seven in the alive and four in the dead condition) answered incorrectly to the memory control question, and four children (three in the alive and one in the dead condition) answered incorrectly to the reality control question. We dropped the latter four participants, resulting in the final analysis sample of $N = 87$ (42 in the alive and 45 in the dead condition; see Appendix A for the rationale of this exclusion criterion).

One notable result (see Figure 2) was that 95.2% of participants in the alive condition answered correctly to the first FB question (“think”) about Squeeky (an ordinary living agent), suggesting that nearly all participants already had a full-fledged representational ToM.

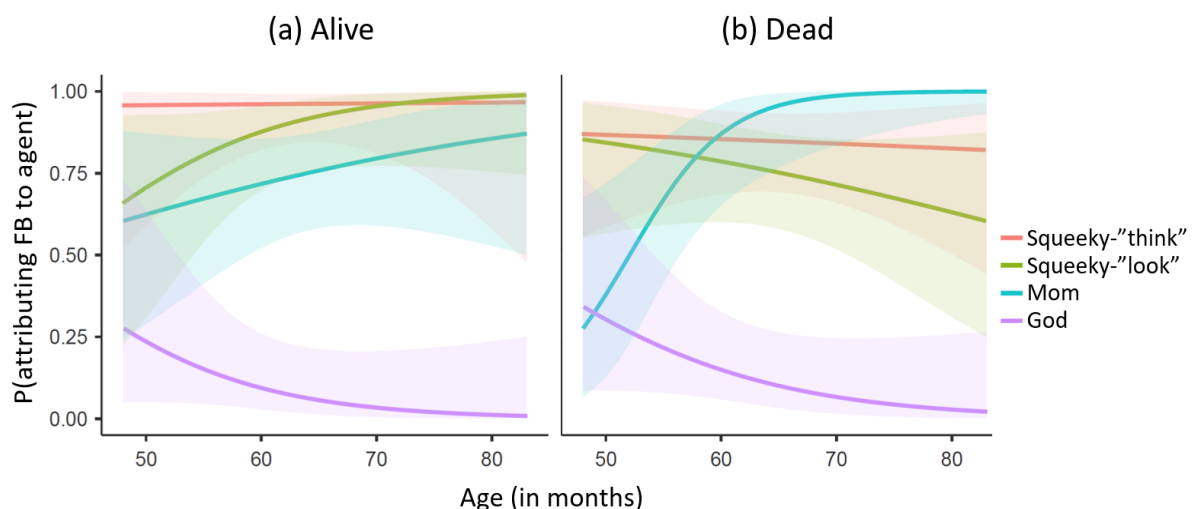


Figure 2. The probability of attributing FB to each agent based on model output under the alive (a) and dead (b) conditions. Shaded areas are 95% confidence intervals based on model estimates.

We fitted a GLMM to the whole data to cover the full design of the study (formally, FB response $\sim$ age $\times$ agent $\times$ scenario condition + (1 | ID)). This analysis revealed a significant main effect of agent, $\chi^2(3) = 52.04$, $p < 0.001$. Model estimates (see Table 2) demonstrated

that children attributed FB to the little protagonist (on the “think” question; $M = 0.86$, $SE = 0.03$) significantly more than to God ($M = 0.12$, $SE = 0.04$), $\beta = -4.95$, $z = -6.59$, $p < 0.001$, but Squeeky-think did not differ from Squeeky-look ($M = 0.80$, $SE = 0.04$) and mom ($M = 0.78$, $SE = 0.05$), $p_s > 0.218$. The main effects of age, $\chi^2(1) = 0.96$, $p = 0.328$, a scenario condition, $\chi^2(1) = 0.07$, $p = 0.791$, and an age $\times$ scenario condition interaction, $\chi^2(1) = 0.09$, $p = 0.766$, were all nonsignificant.

Table 2. Parameter estimates for the fixed effects of the logistic GLMM.

Effect	B	SE	OR	95% CI	z	p
(Intercept)	0.97	0.25	2.64	1.62–4.30	3.89	<0.001 ***
Age	0.02	0.02	1.02	0.97–1.07	0.82	0.414
Condition (Dead – Alive)	−0.08	0.46	0.92	0.37–2.30	−0.17	0.863
SQ-look – SQ-think	−0.68	0.56	0.50	0.17–1.50	−1.23	0.218
Mom – SQ-think	−0.39	0.65	0.68	0.19–2.43	−0.60	0.548
God – SQ-think	−4.95	0.75	0.01	0.00–0.03	−6.59	<0.001 ***
Age $\times$ (SQ-look – SQ-think)	0.04	0.06	1.04	0.92–1.17	0.61	0.545
Age $\times$ (Mom – SQ-think)	0.14	0.07	1.15	1.01–1.32	2.12	0.034 *
Age $\times$ (God – SQ-think)	−0.10	0.07	0.90	0.80–1.03	−1.54	0.124
Age $\times$ (Dead – Alive)	0.01	0.05	1.01	0.92–1.11	0.30	0.766
(SQ-look – SQ-think) $\times$ (Dead – Alive)	0.19	1.11	1.21	0.14–10.60	0.17	0.865
(Mom – SQ-think) $\times$ (Dead – Alive)	3.44	1.32	31.32	2.37–413.39	2.62	0.009 **
(God – SQ-think) $\times$ (Dead – Alive)	2.15	1.23	8.60	0.77–96.67	1.74	0.081
Age $\times$ (SQ-look – SQ-think) $\times$ (Dead – Alive)	−0.13	0.12	0.88	0.69–1.11	−1.10	0.273
Age $\times$ (Mom – SQ-think) $\times$ (Dead – Alive)	0.22	0.13	1.24	0.96–1.63	1.63	0.103
Age $\times$ (God – SQ-think) $\times$ (Dead – Alive)	0.03	0.13	1.03	0.80–1.34	0.26	0.793

Note: OR = Odds Ratio. CI = Confidence Interval for OR. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Concerning the alive–dead difference, additional simple effect analyses for each agent showed a nonsignificant trend of higher FB attribution in the dead compared to the alive condition for Squeeky-think ($\beta = -1.53$, $z = -1.78$, $p = 0.075$) and Squeeky-look ($\beta = -1.34$, $z = -1.78$, $p = 0.075$). For mom, there was an opposite but also nonsignificant trend of lower FB attribution in the dead compared to the alive condition ($\beta = 1.92$, $z = 1.88$, $p = 0.060$), and for God, there was no significant difference ($\beta = 0.63$, $z = 0.69$, $p = 0.492$).

The GLMM showed that the age and scenario condition each interacted significantly with agent; agent $\times$ age: $\chi^2(3) = 13.05$, $p = 0.005$; and agent $\times$ scenario condition: $\chi^2(3) = 9.80$, $p = 0.02$. For the agent $\times$ age interaction, only the difference between Squeeky-think and mom was significantly moderated by age ($\beta = 0.14$, $z = 2.12$, $p = 0.034$) such that their difference decreased with age.

As for the agent $\times$ scenario condition interaction, the influence of the scenario condition was again different between Squeeky-think and mom ($\beta = 3.44$, $z = 2.62$, $p = 0.009$), such that children attributed FB to mom less often than to the *alive* protagonist and more often than to the *dead* protagonist. The visual inspection of Figure 2 indicates a similar trend for the (Squeeky-look – Mom) $\times$ scenario condition interaction; in the alive condition, children were less likely to attribute FB to mom than to Squeeky-look, but this trend was reversed in the dead condition. To confirm this trend, we re-fitted the same GLMM as above, this time treating mom as the reference level of agent, which produced a significant interaction, $\beta = -3.26$, $z = -2.60$, $p = 0.009$.

An age $\times$ agent $\times$ scenario condition interaction was also significant, $\chi^2(3) = 7.94$, $p = 0.047$. To decompose the three-way interaction, we conducted separate logistic regression analyses for each agent, focusing on the two-way interactions (age $\times$ scenario condition) for further interpretation. Responses to the Squeeky-“look” and mom questions were significantly influenced by a scenario condition $\times$ age interaction, $\chi^2(1) = 4.21$, $p = 0.040$ for Squeeky-look, and $\chi^2(1) = 5.88$, $p = 0.015$ for mom. No such interaction was found for Squeeky-think or God, $\chi^2(1) = 0.04$, $p = 0.860$ for Squeeky-think, and $\chi^2(1) = 0.08$, $p = 0.782$ for God.

Re-fitting the same GLMM, as above, with Squeeky-look as the reference level of agent also confirmed the significance of the (Squeeky-look – Mom) $\times$ (dead – alive) $\times$ age interaction, $\beta = 0.35$, $z = 2.80$, $p = 0.005$. Further simple effect analyses indicated that for both Squeeky-look and mom, while the alive-dead difference was not significant in younger children ($ps > 0.25$), it was significant in older children. Specifically, in the older group, fewer FB responses were elicited in the alive compared to the dead condition for Squeeky-look ($\beta = -2.74$, $z = -2.18$, $p = 0.029$), whereas the opposite pattern was observed for mom ($\beta = 3.84$, $z = 2.13$, $p = 0.033$).

Lastly, a visual inspection of Figure 2 indicates an additional trend where with increasing age, children attributed FB more frequently to mom, but less so to God. To confirm these trends, we re-fitted the same GLMM as above, this time treating mom as the reference level of agent. The GLMM confirmed a significant age $\times$ (mom – God) interaction ($\beta = 0.24$, $z = 3.56$, $p < 0.001$). Further simple effect analyses indicated significant age effects for both mom ($\beta = 0.14$, $z = 2.83$, $p = 0.005$) and God ($\beta = -0.10$, $z = -2.14$, $p = 0.032$).

4. Discussion

In this study, we used a location-change FB task with a story about a mouse to investigate whether children perceive a deceased agent as a supernatural, “in-between” agent with a greater information-updating capacity than ordinary living agents. The main findings are as follows.

First, over 95% of children in the alive condition correctly attributed FB to the protagonist (i.e., an ordinary living agent) on the “think” question, indicating that almost all the participants already had a fully developed representational ToM. Second, most children ascribed a correct (i.e., infallible) belief or super-knowingness to God. This result could be interpreted as supporting the preparedness hypothesis (Barrett et al. 2001), which posits a natural predisposition to understand God’s omniscience. However, this interpretation should be approached with caution, as participants were informed about God’s disembodied and omniscient nature before the FB task.

Moreover, the tendency to differentiate omniscient God from ordinary people (mom) was more pronounced with age. This age effect aligns more closely with the anthropomorphizing hypothesis (Giménez-Dasí et al. 2005; Lane et al. 2010; Makris and Pnevmatikos 2007), which suggests that children initially conceptualize God in human-like terms; as they grow older, they develop a better understanding of the limitations of human minds, and they gain greater exposure to the religious conception of deities, increasingly distinguishing between the supernatural capacities of deities.

Another interpretation is that children attributed super-knowingness to God not due to a belief in God’s extraordinary mind, but rather because of their apprehension of God’s extraordinary vision, especially since God was described as “seeing us”. This is in line with previous research indicating that children older than 5 years understand that characters with special vision have access to visual information beyond the reach of ordinary human vision (Lane et al. 2010, 2012). This understanding might complement the

anthropomorphizing hypothesis, as it seems to be also based on their conceptual grasp of ordinary human capacities.

Third and most critically for this study, the biological state of the mouse protagonist showed a nonsignificant trend of decreased FB attribution when the animal was dead compared to when alive, across both ‘think’ and ‘look’ question formats. If religiously framed descriptions of God and death (“Squeaky went to heaven”) had primed the conception of the disembodied, supernatural mind of the dead, children should have perceived the dead as more knowing than the living. In light of previous research showing that priming the religious conception of death activated belief in the continuity of mind (Astuti and Harris 2008; Harris and Giménez 2005), our results thus implicate that unlike the continuity belief, the conception of the dead as an “in-between” agent is not automatically activated by religious context.

Lastly, unlike the protagonist-“think” question, performance on the “look” question was unexpectedly moderated by an interaction between age and scenario condition; as age increased, children showed a growing tendency to attribute FB to the living protagonist but a decreasing tendency to the *dead* protagonist. Given that “think” and “look” versions of the FB question generally yield similar performance in children (Wellman et al. 2001), the age by scenario-condition interaction observed for the “look” question (but not for the “think” question) might be attributed to task-irrelevant factors. As the FB questions were presented in a fixed order, with the “think” question first, it is possible that exposure to the “think” question influenced children’s interpretation and responses to the subsequent “look” question. This influence could have varied depending on whether the protagonist was described as alive or dead, potentially leading to contrasting responses in the “look” question.

Framing the pattern of this interaction in terms of the deviation from performance on the “think” question (see Figure 2), we noticed that in the alive condition, younger children’s responses to the “look” question tended to diverge from their responses to the “think” question. This divergence suggests that younger children’s representational ToM was relatively less solid, making them more susceptible to the contextual influence of question order compared to older children. Conversely, in the dead condition, it was older children who responded differently to the two questions. This suggests that asking two similar questions in succession about a dead agent’s mental state activated, at least in some older children, the religious conception of the dead’s disembodied mind. Presumably, these older children had been more exposed to such religious ideas, making them more likely to respond to the “look” question in a way that is consistent with this conception, unlike younger children.

Interestingly, responses to the mom question were also unexpectedly moderated by an interaction between age and the scenario condition, which could further support the above speculation. Despite the identical description of mom, older children were more likely to attribute FB to mom when she was paired with a dead protagonist, as opposed to a living protagonist. In contrast, younger children did not display this tendency across the two scenarios. This pattern cannot be explained by age differences in attentional or cognitive capacities, as it is usually younger children who are more susceptible to task-irrelevant information due to their premature ToM or attentional functions. Thus, the scenario condition (dead versus living protagonist) seems to have influenced older children’s reasoning more significantly, likely because they incorporated abstract concepts, such as religious or metaphysical ideas, into their understanding. Younger children, by contrast, appeared to rely on more straightforward cognitive strategies that were unaffected by such abstract influences.

These differences are better understood as stemming from varying levels of cultural exposure to religious or spiritual ideas, rather than disparities in ToM or cognitive abilities. Older children, having had more exposure to cultural and abstract concepts, were more likely to integrate these ideas into their reasoning. Meanwhile, younger children relied more on observable and concrete information. These findings shed light on how cultural and developmental factors shape children's social cognition and reasoning processes.

Lastly, it is very notable that this scenario condition by age interaction observed for the mom question showed a pattern opposite to that observed for the protagonist-“look” question (see Figure 2). When older children perceived the dead protagonist as less fallible than ordinary agents, attributing a correct mental state to it (on the “look” question), they were significantly more likely to attribute FB to mom, underscoring the differences between them. However, this contrast was not evident in the alive condition, possibly because mom was perceived as fallible as the living protagonist.

Another peculiarity related to the mom question was the main effect of age; with increasing age, children attributed FB to mom more frequently. Considering the consistent high performance for the alive protagonist across ages, younger children's less frequent FB attribution to mom likely reflects their relative inclination to ascribe a correct mental state to mom, not a lack of complete FB understanding. A plausible speculation is that younger children perceived mom as more knowledgeable than the little protagonist, using age as an indicator of an individual's knowledge and competence. Support for this hypothesis comes from recent studies indicating that children's FB attribution to ordinary individuals can be biased by task-irrelevant information about the target person's age (Seehagen et al. 2018) and competence (Zmyj and Seehagen 2018). Notably, our findings on participants' age effect for the mom question parallel Seehagen et al.'s (2018) study, which found that younger children (4-year-olds) were less likely to attribute FB to an adult than to their peer-aged protagonist, but this bias disappeared in older children (6-year-olds). In line with our findings, younger children's susceptibility to the protagonist's age information suggests that they have a less mature understanding that all ordinary individuals, irrespective of age, share similar limitations and fallibilities.

On the other hand, this result is incompatible with other findings that children differentiated mom in FB tasks from extraordinary agents, but not from other “ordinary” agents, such as a girl, a classmate, or ordinary animals or plants (Barrett et al. 2001, 2003; Lam and Guerrero 2020; Lane et al. 2010; Richert and Barrett 2005). A possible explanation for this apparent discrepancy could be the types of FB tasks used in these studies. As reviewed in the introduction, most previous research (including the above ones) relied on the surprising-contents task or its variants, which are contextless and do not involve a narrative about the agents in question, leading children to base their FB judgments solely on their knowledge about the agents' mental capacities, in isolation from the agents' environmental contexts. In contrast, the location-change task we used involved two notable characteristics related to mom as follows: (1) mom was a character in the scenario alongside the protagonist, and (2) more importantly, the story was set within her family and home context, a familiar environment to the young participants as well as to mom, thereby offering high ecological validity. In light of this setup, a more radical speculation is that younger children might have perceived mom as nearly omniscient and super-competent, at least within the context of the home environment and parent–children relationship. From their own experiences with their mother, children might have learned that mom is a special agent who possesses comprehensive knowledge about her home and family, and thus, the home and family context could activate such a god-like conception of mother (c.f., Piaget 1929). As they become older, however, children would learn that mom is one of the fallible ordinary people and then would be more likely to attribute FB to mom even in the home context.

In light of the current findings, a question to further address might be why the priming of the religious conception of death (by the description, “Squeaky went to heaven”) was not sufficient to activate the concept of the dead as an “in-between” agent possessing supernatural information-updating capacities. The current findings suggest that children might not be predisposed to view dead agents as disembodied and that such a conception requires cultural learning through exposure to religious narratives or conventions. It is not universal that deceased people are conceived as disembodied minds with supernatural capacities (Barlev and Shtulman 2021); although in some cultures people conceptualize death as the transition of a living person to a new form of disembodied existence with extraordinary mental capacities, in other cultures, dead individuals are conceived as maintaining many biological functions in the afterlife (Barlev and Shtulman 2021; Hodge 2008; Watson-Jones et al. 2017). Thus, without a more explicit description of the dead agents’ characteristics, children might not have a clear idea of what supernatural capacities the dead would possess, and then, the dead would likely be readily anthropomorphized (e.g., children could have thought that the dead protagonist lived an afterlife in heaven as a form of bodily agent, bound by space and time).

Another possibility is that the perceived mental capacity of a deceased individual may be influenced by their socio-cognitive attributes (e.g., age, competence, or social power) during their lifetime. Consider polytheistic religions that involve the deification of deceased individuals into divine figures. In such cultures, all dead persons could potentially be deities, but politically, intellectually, morally, or religiously influential figures are more likely to be deified than ordinary people who lack such impact (Dávid-Barrett and Carney 2016; Eller 2014). Given this ethnographic observation, a person who held a high socio-cognitive status while alive would more likely be attributed supernatural capacities, granting them access to information beyond what ordinary individuals can access. Recent psychological research with adult participants indeed showed that the attribution of mental capacities to deceased individuals is influenced by their levels of mental functioning during their lifetime. A study by Doyle and Gray (2020) showed that deceased individuals with higher mental functioning at the moment of death were considered to have more postmortem mental capacities than those who died with lower functioning. Furthermore, people are more likely to attribute immortality to historical figures who had a moral impact on society (either good or bad way) than others who had not, and more interestingly, unlike evil-doers, good-doers are conceived as possessing “transcendent immortality” with their postmortem minds persisting beyond space and time (Gray et al. 2018).

After all, the dead protagonist in our FB scenario was just a little kid—participants’ peer-aged agent, who would be perceived as possessing a similar level of mental capacities to their own. Along this line of reasoning, future research will be able to test the condition in which our little protagonist is replaced by an adult who is knowledgeable, competent, or a social or religious authority. In this condition, would children be more likely to attribute correct mental states to such an adult character? And if so, would they be more likely so when he or she is deceased? To further understand how the belief system for the ordinary minds can expand to the disembodied, religious minds, including God, future research needs to investigate under what conditions children perceive a dead individual as a supernatural “in-between” agent.

Limitations and Future Research

The study faces several limitations that could impact its interpretations. One notable limitation relates to individual differences in religious and cultural backgrounds, as our study did not collect information about participants' religious backgrounds nor control for it. For instance, a Christian child might interpret the phrase "Squeeky went to heaven" through a specific cultural schema involving spirits or souls, which could influence their assessment of the dead agent's mental and perceptual capacities. In contrast, non-Christian children might not associate the phrase with death but instead interpret it as Squeeky simply going to a place called "heaven". This highlights the importance of controlling for religious background, even if it is cultural rather than formal or participatory. Future studies should address this limitation by collecting religious background information or using participant selection criteria to better control for these factors. Another limitation concerns the age range of our participants. In this study, even the youngest group of children (4-year-olds) showed high-level understandings of both the living protagonist's fallible belief and God's infallible knowledge, such that we were unable to assess the full trajectory of developmental change in the conception of the dead's extraordinary capacities (for a more detailed discussion on this issue, see [Lane et al. 2010](#)). Additionally, the study's focus on a personified animal protagonist, rather than a human, could have impacted the children's responses, particularly if they hold beliefs about the afterlife being exclusive to humans and not animals ([Harris and Astuti 2006](#)). These aspects highlight the need to consider various factors, such as cultural context, developmental stage, and the nature of the protagonist, in interpreting the results and in further research.

5. Conclusions

In summary, this study explored whether children attribute more mental and perceptual capacities to an individual when dead compared to when alive. While the evidence for children's differential responses to a dead versus an alive agent was inconclusive, we observed that older children were more likely to distinguish between the living mom and the dead protagonist, which possibly reflects their exposure to religious or spiritual ideas. These findings collectively suggest that children are not inherently predisposed to view dead agents as disembodied. Instead, they underscore the critical role of cultural learning in shaping the development of such religious beliefs.

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Institutional Review Board Statement: The study was conducted according to the guidelines of the Declaration of Helsinki and approved by Ewha Womans University Human Ethics Committee (protocol code: 202101-0013-01, ethical approval date: 25 January 2021).

Informed Consent Statement: Informed consent was obtained from all participants involved in the study.

Data Availability Statement: Data are available from the corresponding author upon request.

Conflicts of Interest: The authors declare no conflicts of interest.

Appendix A

Table A1. Full description of pictures, scenarios, and questions 1–4 for alive and dead conditions.

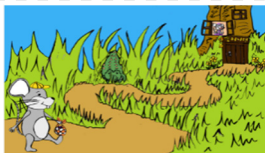
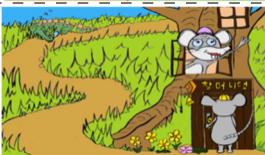
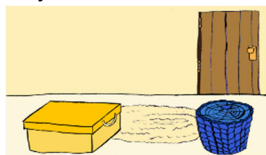
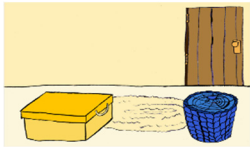
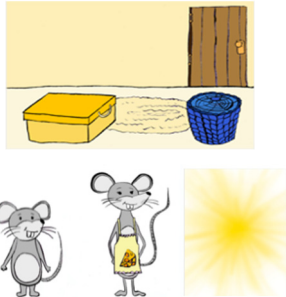
Scene 1		When Squeeky played with a red ball in his room, mommy mouse came to ask him to bring a present to his grandmother.	
Scene 2		Squeeky put the ball in the yellow box and left for the errand.	
Question 1	(Attention check) “Did mommy mouse see Squeeky put the ball into a yellow box?”		
Scene 3		Squeeky headed to grandma’s house along the road beside the bushes.	
	Alive	Dead	
Scene 4			[Alive] The alligator was sleeping behind the bushes and couldn’t see Squeeky. [Dead] The alligator watched Squeeky behind the bushes.
Scene 5			[Alive] Squeeky arrived safely at his grandmother’s house. [Dead] The alligator got Squeeky.
Scene 6			[Alive] He met his grandma and was able to finish his job well. [Dead] Finally, Squeeky was eaten by the alligator and went to heaven.
Questions 2–3	(Biological) “Will Squeeky be able to grow up to be an old mouse?”		
Question 4	(Psychological) “Will Squeeky miss his mom?”		
	(Memory check) “Do you remember where Squeeky put the ball before he leaves?”		
Scene 7		This is Squeeky’s room. There is nobody, not even his mom, after Squeeky left for the errand.	
Scene 8		Later, Squeeky’s little sibling came in and took the ball out of the yellow box and moved it to the blue basket.	

Table A2. Full description of the control and false belief questions.

Control questions		(Memory) “Where did Squeeky put the ball before it left?” [correct answer: yellow box] (Reality) “Where is the ball now?” [correct answer: blue basket]
False belief questions		(Think) “Where would ____ (Squeeky, Mom, or God) think the ball is now? Yellow box or blue basket?” [TB answer: blue basket, FB answer: yellow box] (Look) “Squeeky still wants to play with ball. Where would he look? Yellow box or blue basket?” [TB answer: blue basket, FB answer: yellow box]

Note: “Now Squeeky is in heaven” was added before the false belief (both “think” and “look”) questions about “dead” Squeeky.

The Rationale for the Participant Exclusion Criteria for the Control Questions

We dropped four participants who failed the reality control question, resulting in the final analysis sample of $N = 87$. We adopted this minimal exclusion criterion regarding control questions for the following reasons. First, unlike in typical ToM studies, our main interest in this study was not evaluating children’s ability to represent others’ FBs, but comparing the patterns of their FB attribution to different agents; thus, it was less essential to ensure that they passed the control questions. Indeed, some previous ToM studies comparing children’s FB attribution to human vs. non-human, supernatural agents did not use control questions, possibly to make the task short and simple (e.g., [Burdett et al. 2021](#); [Di Dio et al. 2018](#); [Wigger et al. 2013](#)). Second, a larger number of children failed the memory question than the reality question, possibly because questions were given in a fixed order; the memory question, which was asked first, might have worked as a retrieval cue for the memory of the story, improving performance in the subsequently given reality question. We thus thought that responses to the reality question would reflect children’s understanding of the scenario more accurately than those to the memory question. Third, as seen in the results, almost all participants (95.2%) answered correctly to the first FB question about an ordinary living agent (Squeeky-“think” question in the alive condition), which according to previous work (e.g., [Baratgin et al. 2020](#)), requires a reality control question for checking their understanding of the true location of the target object. Analyses that excluded additional children who failed the memory control question yielded quantitatively the same results as those reported here.

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